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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/770,893	02/03/2004	Shihong Gary Song	67097-022	1084
26096	7590	08/08/2007		
CARLSON, GASKEY & OLDS, P.C. 400 WEST MAPLE ROAD SUITE 350 BIRMINGHAM, MI 48009			EXAMINER MORILLO, JANEL COMBS	
			ART UNIT 1742	PAPER NUMBER
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/770,893	<b>Applicant(s)</b> SONG, SHIHONG GARY	
	<b>Examiner</b> Janelle Combs-Morillo	<b>Art Unit</b> 1742	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 15 May 2007.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-16 and 26-29 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-16 and 26-29 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date <u>5/22/07</u> | 6) <input type="checkbox"/> Other: _____  |

**DETAILED ACTION**

***Claim Rejections - 35 USC § 103***

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-4, 10-13, 26-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Watson (US 6,248,453).

Watson teaches an aluminum alloy with high strength and excellent thermal stability (column 4 line 31) comprising 10-70vol%  $Al_3X L1_2$  formers including Er, Yb, Ti (column 3 lines 5-8, column 6 lines 11-15), and  $\geq 1$ wt% one or more of Mg, Ag, Zn, Li, and Cu (column 2 lines 35-54) which form solid solution matrix with aluminum. Watson teaches that a plurality of dispersion particles form from said added elements, namely  $Al_3X L1_2$  particles are formed (abstract, etc). Though Watson teaches a preferred embodiment of 3-16wt% Sc, 3-6% Mg, 2-5% Zr, and 0.1-4% Ti (column 2 lines 10-11), Watson teaches that all of Ti, Zr, Sc are  $L1_2$  formers, as well as Er and Yb; and can be substituted for one another (column 3 lines 5-8). It would have been obvious to replace Sc with Er and Yb, because it is prima facie obvious to substitute equivalents known for the same purpose, see MPEP 2144.06. Therefore, the composition taught by Watson overlaps the presently claimed ranges of Yb and Er, as well as 1+ minor element selected from Ti, Mg, Ag, Zn, and Cu (cl. 1-4, 10-13, 26-29).

Art Unit: 1742

Concerning claims 10-13, Watson further teaches the alloy can be used for gas turbine engines where low weight is required and temperatures are on the order of 300°C (column 5 lines 46-50).

Because Watson teaches an overlapping alloy composition, it is held that Watson has created a prima facie case of obviousness of the presently claimed invention. Overlapping ranges have been held to be a prima facie case of obviousness, see MPEP § 2144.05. It would have been obvious to one of ordinary skill in the art to select any portion of the range, including the claimed range, from the broader range disclosed in the prior art, because the prior art finds that said composition in the entire disclosed range has a suitable utility. Additionally, "The normal desire of scientists or artisans to improve upon what is already generally known provides the motivation to determine where in a disclosed set of percentage ranges is the optimum combination of percentages," *In re Peterson*, 65 USPQ2d at 1379 (CAFC 2003).

3. Claims 1-5, 7, 8, 10-16, 27-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Higashi et al (US 4,713,216).

Higashi teaches an aluminum alloy with excellent properties comprising 0.5-10% total one or more RE elements including Gd, Er, Yb, and Y (column 2 lines 31-32, 51) in order to improve the resistance to stress and corrosion and improve workability of said aluminum alloy (column 2 lines 38-40, 54-57), which is a close approximation of "greater than 10% weight" total of 1<sup>st</sup> and 2<sup>nd</sup> RE elements in instant claims 1, 4, 5, 7, 8, 10, 13-16. Said alloy also contains Zn, Mg, Mn, Cu in ranges that fall within the claimed "at least one minor element" ranges of instant claims 2, 3, 11, 12, 28, 29 (see Table 4, Higashi at cl. 1 and 2).

Art Unit: 1742

Though Higashi does not specify that particles/precipitates are formed from said RE additives, Higashi does teach precipitation age hardening in said examples. Because the composition taught by Higashi is a close approximation of the presently claimed composition, and because Higashi teaches precipitation age hardening step, then substantially the same precipitates are expected to form as in the instant case. Overlapping ranges have been held to be a prima facie case of obviousness, see MPEP § 2144.05. A prima facie case of obviousness exists where the claimed ranges and prior art ranges do not overlap but are close enough that one skilled in the art would have expected them to have the same properties. *Titanium Metals Corp. of America v. Banner*, 778 F.2d 775, 227 USPQ 773 (Fed. Cir. 1985).

Concerning claims 10-16, though Higashi does not mention using said alloy for gas turbine engine components, it would have been obvious to one of ordinary skill in the art to form the alloy taught by Higashi into gas turbine engine component, because Higashi teaches the Al-RE alloy has excellent mechanical properties, and improved resistance to stress and corrosion (column 2 line 40).

4. Claims 1-3, 7-12, 15, 16, 26, 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over EP 570911 A1 (EP'911).

EP'911 teaches an aluminum alloy composition with  $Al_aFe_bRE_cMn_d$ , wherein  $a=85-95at\%$ ,  $b=2-8at\%$ ,  $c=1-6at\%$ ,  $d=0.5-6at\%$ , and RE includes at least one element selected from a markush group including Y and Gd (page 3 lines 12-15), which overlaps the composition in claims 1-3, 7-12, 15, 16, 26. The composition of claim 9 of: 13-16wt% Gd and approx. 4wt% Y, converts to: 2.6-3.3at% Gd and approx. 1.4at% Y, balance aluminum, which falls within the alloy taught by EP'911. EP'911 further teaches intermetallic compounds are formed w RE

Art Unit: 1742

elements, thereby resulting in increased hardness, strength, and toughness (column 2 line 25-26). Though EP'911 does not specify the addition of at least one minor element such as Mg (or Cu, Zn, Ag, Mg, Sn, Ti, Co, Ca) in claims 1, 3, 10, 12, 27, the instant claims do not recite a minimum amount of said element(s), and therefore inevitable impurity amounts of said element(s), inherently expected in the prior art, are held to meet said claim limitation.

Because EP'911 teaches an overlapping alloy composition, it is held that EP'911 has created a prima facie case of obviousness of the presently claimed invention. Overlapping ranges have been held to be a prima facie case of obviousness, see MPEP § 2144.05.

Concerning claims 10, 12, 15, 16, though EP'911 does not mention using said alloy for gas turbine engine components, it would have been obvious to one of ordinary skill in the art to form the alloy taught by EP'911 into gas turbine engine component, because EP'911 teaches the Al-RE alloy has excellent mechanical properties, such as increased hardness, strength, and toughness (column 2 line 25-26).

5. Claims 1-6, 10-14, 26-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Olson et al (US 2004/0055671A1).

Olson teaches aluminum alloys having improved strength characteristics at high temperatures said alloys comprising (in at%): 2-15at% Er, Yb, 2-7at% Ni, Co, Fe, Cu, <5at% Y [0013], which overlaps the composition in instant claims 1-6, 10-14, 26-29. The composition of claim 6 of: 13-16wt% Yb and approx. 4wt% Y, converts to: 2.3-3at% Yb and approx. 1.4at% Y, balance aluminum, which falls within the alloy taught by Olson. Olson further teaches intermetallic compounds are formed w RE elements to create cubic precipitates with high crystallographic symmetry, thereby resulting in an excellent combination of strength and

Art Unit: 1742

toughness [0005], and said alloy are suitable for using for 'high' temperature applications of ~300 °C such as fan components for turbine engines [0003].

Because Olson teaches an overlapping alloy composition, it is held that Olson has created a prima facie case of obviousness of the presently claimed invention. Overlapping ranges have been held to be a prima facie case of obviousness, see MPEP § 2144.05.

### ***Response to Amendment***

6. In the response filed on May 15, 2007, applicant amended claims 1-4, 6, 7, 9, 10, 13, 15, and added new claims 26-29. The examiner agrees that no new matter has been added.

Applicant's argument that the present invention is allowable over the prior art of record because Watson does not teach or suggest the instant composition has not been found persuasive. Though Watson teaches a preferred embodiment of 3-16wt% Sc, 3-6% Mg, 2-5% Zr, and 0.1-4% Ti (column 2 lines 10-11), Watson teaches that all of Ti, Zr, Sc are L12 formers, as well as Er and Yb; and can be substituted for one another (column 3 lines 5-8). Therefore, the composition taught by Watson overlaps the presently claimed ranges of Yb and Er, as well as 1+ minor element selected from Ti, Mg, Ag, Zn, and Cu (cl. 1-4, 10-13, 26-29). It would have been obvious to replace Sc with Er and Yb, because it is prima facie obvious to substitute equivalents known for the same purpose, see MPEP 2144.06.

7. Applicant's argument that the present invention is allowable over the prior art of record because Higashi's teaching of RE level up to 10wt% does not overlap the instantly claimed RE total of >10wt% has not been found persuasive. A prima facie case of obviousness exists where the claimed ranges and prior art ranges do not overlap but are close enough that one skilled in the art would have expected them to have the same properties. *Titanium Metals Corp. of America v.*

Art Unit: 1742

*Banner*, 778 F.2d 775, 227 USPQ 773 (Fed. Cir. 1985). The maximum amount of RE elements taught by Higashi of 10wt% is held to be a close approximation of the claimed level of 'greater than 10.0% by weight'.

Applicant's argument that the present invention is allowable over the prior art of record because EP does not specify the addition of at least one minor alloy element of Cu, Zn, Ag, Mg, Sn, Ti, Co, or Ca; has not been found persuasive. As stated above, though EP'911 does not specify the addition of at least one minor element such as Mg (or Cu, Zn, Ag, Mg, Sn, Ti, Co, Ca) in claims 1, 3, 10, 12, 27, the instant claims do not recite a minimum amount of said element(s), and therefore inevitable impurity amounts of said element(s), inherently expected in the prior art, are held to meet said claim limitation.

8. The declaration filed on May 15, 2007 under 37 CFR 1.131 has been considered but is ineffective to overcome the Oslen (US 2004/0055671A1) reference. Said declaration is ineffective for reasons a)-c) set forth below.

Concerning reason a), said declaration does not contain the mandatory statement that "willful false statements and the like are punishable by fine and imprisonment, or both (18 U.S.C. 1001), and may jeopardize the validity of the application or any patent issuing thereon".

Concerning reason b), said declaration does not state where the invention occurred. Rule 1.131 states that "Prior invention may not be established under this section in any country other than the United States, a NAFTA country, or a WTO member country".

Concerning reason c), said declaration was not signed by the inventor(s). Rule 1.131 states that "When any claim of an application or a patent under reexamination is rejected, the inventor of the subject matter of the rejected claim, the owner of the patent under reexamination,



Art Unit: 1742

or the party qualified under §§ 1.42, 1.43, or 1.47, may submit an appropriate oath or declaration to establish invention of the subject matter of the rejected claim prior to the effective date of the reference or activity on which the rejection is based.” The attorney of record, who signed the instant declaration, has not been established as being a party qualified under §§ 1.42, 1.43, or 1.47.

### ***Conclusion***

9. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Janelle Combs-Morillo whose telephone number is (571) 272-1240. The examiner can normally be reached on 8:30 am- 6:00 pm.

Art Unit: 1742

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy King can be reached on (571) 272-1244. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

JCM  
August 1, 2007

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